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Beth Pearson-Naul

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:

Malthe-Sorensen et al.

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Docket No: CON-1006D1

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Serial No:

§

Art Unit:

§

Filed:

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Examiner:

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Title: Method of modeling of faulting and  
fracturing in the earth

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**PRELIMINARY AMENDMENT**

Prior to any substantive action in this case, please amend the application as indicated below.

**CHANGE OF INVENTORSHIP**

The application was originally filed with the following inventors:

Anders Malthe-Sorensen, Thomas Walmann, Torstein Jossang, Geri Wagner, Jens

Feder and Humphrey H. Hardy. Please delete Geri Wagner as an inventor.

**IN THE SPECIFICATIONS**

On the first page of the specification (page 2), prior to the 'Background of the Invention' section, please insert the following:

## Cross-References to Related Applications:

This application is a divisional of United States Patent Application Ser. No.

09/542,307 filed on April 4, 2000, now United States Patent No. \*\*\*\*\*.

## IN THE CLAIMS

The following is a clean set of claims in the application.

- 1      33.    A method of simulating deformation without faulting and fracturing due to an  
2            initial deformation pattern applied to boundaries of a subsurface volume  
3            modeled by a plurality of interconnected nodes, the method comprising:  
4            (a)    defining a plurality of boundary nodes on a boundary of said  
5            subsurface volume wherein said initial deformation pattern is applied;  
6            (b)    defining an initial and a final position for each of said plurality of  
7            boundary nodes and a displacement there between;  
8            (c)    determining a distance from each of the plurality of interconnected  
9            nodes to the final positions of the plurality of boundary nodes;  
10          (d)    determining a displacement for each of the plurality of interconnected  
11          nodes as a combination of said displacement of said boundary nodes weighted  
12          by a weighting function related to said distance from each of the plurality of  
13          interconnected nodes and the final positions of the boundary nodes.
- 1      34.    The method of claim 33, wherein said weighting function includes an  
2            exponential factor related to said distance from each of the plurality of  
3            interconnected nodes and the final positions of the boundary nodes.

1 35. The method of claim 34, wherein said weighting function further includes a  
2 matrix whose coefficients are obtained by solving a plurality of equations  
3 including said displacement of the boundary nodes wherein the plurality of  
4 equations is three times the plurality of said boundary nodes.

Please add the following new claims:

1 44. The method of claim 33, wherein selecting said boundary nodes, defining a  
2 subsurface model, and specifying deformation positions further comprises  
3 using a graphical user interface.

1 45. The method of claim 33, wherein said nodes are arranged in a grid that is one  
2 of of (i) a triangular grid, (ii) a rectangular grid, and (iii) a random grid.

1 46. The method of claim 33, wherein specifying said initial deformation pattern  
2 further comprises performing a reconstruction based at least in part upon an  
3 observed large-scale deformation corresponding to said subsurface volume.

1 47. The method of claim 46, wherein said reconstruction is a palinspastic  
2 reconstruction.

### REMARKS

Claims 1-43 were originally filed in the parent application Ser. No.

09/542,307. In a Election/Restriction Requirement under 35 U.S.C. 121, election was

required to be made between claims directed to the following patentably distinct species of the claimed invention:

- I. Claims 1-32, drawn to methods of modeling faulting and fracturing in a subsurface volume including use of a dynamic range relaxation algorithm, classified in class 703.
- II. Claims 33-35, drawn to a method of simulating deformation without faulting and fracturing due to an initial deformation pattern, classified in class 703.
- III. Claims 36-43, drawn to a graphical user interface for displaying and manipulating a model of interconnected nodes, classified in class 345.

In response to the Restriction requirement, Applicant elected to prosecute claims 1-32 from Group I, without traverse, in the parent application. In the present application, Applicant elects to prosecute claims 33-35 from Group II.

Claims 33-35 and 44-47 are pending in the present application. Claim 33 is an independent claim. No claims have been amended. New claims 44-47 have been added. No new matter has been added by the amendments. Consideration of this divisional application is respectfully requested.

Inventor Geri Wagner participated only in the invention of Claims 36-43 of Group III. An amendment has been filed pursuant to 37 C.F.R § 1.48 (b).

**In 37 C.F.R § 1.48 Correction of inventorship in a patent application, other than a reissue application, pursuant to 35 U.S.C. 116. (b) Nonprovisional application—fewer inventors due to amendment or cancellation of claims.** If the correct inventors

are named in a nonprovisional application, and the prosecution of the nonprovisional application results in the amendment or cancellation of claims so that fewer than all of the currently named inventors are the actual inventors of the invention being claimed in the nonprovisional application, an amendment must be filed requesting deletion of the name or names of the person or persons who are not inventors of the invention being claimed. [revised, 65 FR 54604, Sept. 8, 2000, effective Nov. 7, 2000]

Please delete Geri Wagner as an inventor. No new matter has been added by the amendment. Consideration of the application as amended is respectfully requested.

A check for \$710.00 for the basic filing fee is enclosed. Extra claim fees for the claims in this amendment are not believed to be due. Accordingly, no further fee is believed to be due. Please charge any deficiencies, if required, and credit any overpayment for the filing of this amendment to Deposit Account No. 13-0010 (CON-1006D1). A duplicate copy of this cover letter is enclosed.

Respectfully submitted,



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